CONTENTS OF VOLUME 72

Volume 72 Number 1 10 January 1999

An efficient algorithm for finding the D-stability bound of discrete singularly perturbed systems with multiple time delays
F.-H. Hsiao, S.-T. Pan and C.-C. Teng 1

An observer-based anti-windup scheme for non-linear systems with input constraints
N. Kapoor and P. Daoutidis 18

Robust filter design with time-varying parameter uncertainty and error variance constraints
Z. Wang, J. Zhu and H. Unbehauen 30

Optimal weighted L_2 model reduction of delay systems
L. Zhang and J. Lam 39

An algorithm to solve the discrete HJI equation arising in the L_2 gain optimization problem
J. Huang 49

New characterization of fixed-order controllers based on LMI
H. Tanaka and T. Sugie 58

Automatic vehicle following with integrated throttle and brake control
S. Huang and W. Ren 75

Sensitivity of system norms
M. Konstantinov, P. Petkov, J. Kawelke, A. Linnemann, D. W. Gu and I. Postlethwaite 84

Volume 72 Number 2 20 January 1999

LMI approach to output feedback stabilization of 2-D discrete systems
C. Du and L. Xie 97

Sufficient conditions for Lyapunov's global stability of time-varying hybrid linear systems
M. De la Sen 107

Continuous adaptive robust controllers guaranteeing uniform ultimate boundedness for uncertain non-linear systems
H. Wu 115

Model reference robust control for non-minimum phase systems with disturbances
X. Chen and T. Fukuda 123

Adaptive quasi-sliding mode control for discrete-time multivariable systems
X. Chen and T. Fukuda 133

Deadbeat control system with time-varying uncertainty: minimization of worst case steady-state tracking error
M. Yamada, Z. Riadh and Y. Funahashi 141
A robust transition control structure for time-delay systems
D. Sun and K. A. Hoo 150
Recent developments in generalized predictive control for continuous-time systems
B. Kouvaritakis, M. Cannon and J. A. Rossiter 164
Matrix interpolation: some control applications
M. Karimi, V. Tahani and S. Gazor 174

Volume 72 Number 3 15 February 1999

State space identification of stable systems
P. M. Mäkilä 193
Asymptotic stabilization of driftless systems
D.-C. Liaw and Y.-W. Liang 206
On the solution and impulsive behaviour of polynomial matrix descriptions of free linear multivariable systems
A. I. G. Vardulakis, E. N. Antoniou and N. Karampetakis 215
Input–output linearization by velocity-based gain-scheduling
D. J. Leith and W. E. Leithead 229
Active impedance control of linear one-dimensional wave equations
J. Hu and J.-F. Lin 247
Controlling chaos using invariant manifolds
Y.-P. Tian 258
l^p parameter perturbation and design of robust controllers for linear systems
M. Bozorg and E. M. Nebot 267
Stochastic inclusion principle applied to decentralized automatic generation control
S. S. Stanković, X.-B. Chen, M. R. Mataušek and D. D. Šiljak 276

Volume 72 Number 4 10 March 1999

NARMAX modelling and robust control of internal combustion engines
J. W. Glass and M. A. Franchek 289
Robust maximum principle in minimax control
V. G. Boltyansky and A. S. Poznyak 305
A delta operator approach to discrete-time H_∞ control
E. G. Collins, Jr. and T. Song 315
A robust control design for a class of uncertain non-linear systems featuring a second-order sliding mode
G. Bartolini, A. Ferrara and L. Giacomini 321

An introduction to the shift realization for finite dimensional continuous time systems
R. J. Ober 332
Eigenstructure assignment in descriptor systems via output feedback: a new complete parametric approach
G.-R. Duan 345
Discrete adaptive quasi-sliding mode control
C. Y. Chan 365
On the Liapunov-Krasovskii functionals for stability analysis of linear delay systems
V. B. Kolmanovskii, S.-I. Niculescu and J.-P. Richard 374

Volume 72 Number 5 20 March 1999

A stabilizing output-feedback linear quadratic control for pure input-delayed systems
P. G. Park, Y. S. Moon and W. H. Kwon 385
Robust boundary control for linear time-varying infinite dimensional systems
A. S. Poznyak and A. R. Palacios 392
Gain and phase margin of optimal memoryless regulator of systems with time-delay
T. Kubo and E. Shimemura 404
Robust output tracking of non-linear systems with mismatched uncertainties
Y. Hashimoto, H. Wu and K. Mizukami 411
A non-linear optimal control approach to central sewer network flow control
M. Marinaki and M. Papageorgiou 418
On exponential stabilization of non-linear non-autonomous systems
M. I. Gil' and A. Ailon 430
An algorithm for a minimum fuel control problem
R. Pytlak 435
Characterization of matched systems
T. Satoh, T. Ishihara and H. Inooka 449
Friction compensation using adaptive non-linear control with persistent excitation
K. M. Misovec and A. M. Annaswamy 457

Volume 72 Number 6 15 April 1999

Discrete-time singular observers: $\mathcal{H}_2/\mathcal{H}_\infty$ optimality and unknown inputs
R. H. C. Takahashi, R. M. Palhares and P. L. D. Peres 481
An easily computable estimate for the real unstructured F-stability radius
N. Bobylev, A. Bulatov and P. Diamond 493

Plotting robust root loci for linear systems with multilinearly parametric uncertainties
C. Hwang and J.-J. Chen 501
Performance factorization and measurement selection for partially controlled systems
Y. Cao, D. Rossiter and D. H. Owens 512
Design of robust direct adaptive controllers for SISO systems: time and frequency domain design conditions
S. Ozcelik and H. Kaufman 517
The generalized eigenvalue problem for tridiagonal symmetric interval matrices
M. A. El-Gebeily, Y. Abu-Baker and M. B. Elgindi 531
On characterizing sensitivity-based and traditional formulations for quantitative feedback theory
D. F. Thompson and J. S. Pruyn 536
A simple linear stabilizing controller for a RLED robot with uncertain parameters and some related applications
A. Ailon, M. I. Gil and E. S. Choi 546
Boundary control of Kirchhoff's non-linear string
S. M. Shahruz 560
Robust ripple-free deadbeat control design
A. Casavola, E. Mosca and P. Zecca 564

Volume 72 Numbers 7/8 10/20 May 1999

SPECIAL ISSUE
Multiple Model Approaches to Modelling and Control
Edited by Tor Arne Johansen and Bjarne A. Foss

Editorial: Multiple model approaches to modelling and control
T. A. Johansen and B. A. Foss 575
Process identification with multiple neural network models
B. Eikens and M. N. Karim 576
Non-linear dynamic system identification: a multi-model approach
A. Boukhris, G. Mourot and J. Ragot 591
Analytic framework for blended multiple model systems using linear local models
D. J. Leith and W. E. Leithead 605
On the interpretation of local models in blended multiple model structures
R. Shorten, R. Murray-Smith, R. Bjørgan and H. Gollee 620
Estimation of multiple order models in the δ-domain
A. G. Kuznetsov, R. O. Bowyer and D. W. Clark 629

Lazy learning for local modelling and control design
G. Bontempi, M. Birattari and H. Bersini 643
Estimation and model predictive control of non-linear batch processes using linear parameter varying models
N. M. Lakshmanan and Y. Arkun 659
Non-linear control system design via fuzzy modelling and LMIs
K. Kiriakidis 676
Constrained quadratic stabilization of discrete-time uncertain non-linear multi-model systems using piecewise affine state-feedback
O. Slupphaug and B. A. Foss 686
A parametrization of piecewise linear Lyapunov functions via linear programming
P. Julián, J. Guivant and A. Desages 702
A minimax approach for multi-objective controller design using multiple models
Y. Piguet, U. Holmberg and R. Longchamp 716
A multi-model solution for the control of chaos
A. Duchâteau, N. P. Bradshaw and H. Bersini 727
Neural-fuzzy scheduling of H_∞ robust controllers for a high performance fighter aircraft under a Herbst-like manoeuvre
J. Wang and W. Zhang 740

Volume 72 Number 9 15 June 1999

Boundedness properties of the soft-constrained time-optimal control
M. U. Bikdash 755
Time-optimal control and high-gain linear state feedback
S.-T. Wu 764
Norm based design of fault detectors
M. L. Rank and H. Niemann 773
Adaptive control of ac motor drives with inverter nonlinearities
W. Khan and D. G. Taylor 784
Integrating instrumentation and control design
J. Lu and R. E. Skelton 799
Decentralized H_∞ controller design for composite systems: linear case
G.-H. Yang and J. L. Wang 815
Compensatability and optimal compensation under randomly varying distributed delays
N.-C. Tsai and A. Ray 826
Dynamic optimization of large scale systems: case study
M. C. Colantonio and R. Pytlak 833
On stabilization of uncertain linear systems with jump parameters
E. K. Boukas, P. Shi and K. Benjelloun 842

Volume 72 Number 10 10 July 1999

Digital multirate control for a class of non-linear singularly perturbed systems
M. Djemai, J. P. Barbot and H. K. Khahil 851
H^{∞} control of large-scale jump linear systems via averaging and aggregation
Z. Pan and T. Başar 866
Controlling hyperchaos of the Rössler system
J.-Y. Hsieh, C.-C. Hwang, A.-P. Wang and W.-J. Li 882
Iterative identification and control redesign via unfalsified sets of models: a basic scheme
S. M. Veres 887
Global stabilizability for a class of uncertain systems with multiple time-varying delays via linear control
C.-H. Lien, Y.-J. Sun and J.-G. Hsieh 904
A global control of polynomial chaotic systems
J. Wang and X. Wang 911
Non-linear model based predictive control
B. Kouvaritakis, M. Cannon and J. A. Rossiter 919
Rank condition for the controllability of a linear time-varying system
H. Leiva and H. Zambrano 929
Laguerre and Kautz shift approximations of delay systems
P. M. Mäkilä and J. R. Partington 932

Volume 72 Number 11 20 July 1999

Optimization of parabolic systems with deviating arguments
A. Kowalewski 947
Moving sliding surfaces for high-order variable structure systems
D.-W. Park and S.-B. Choi 960
Robust controller synthesis via non-linear matrix inequalities
E. G. Collins, Jr., D. Sadhukhan and L. T. Watson 971
Recursive identification of continuous-time Wiener systems
W. Greblicki 981
Sliding surface design for singularly perturbed systems
W.-C. Su 990
A semiglobally stable adaptive field-oriented controller for current-fed induction motors
T. Ahmed-Ali, F. Lamnabhi-Lagarrigue and R. Ortega 996
Adaptive control of dc motor drives with converter non-linearities
W. Khan and D. G. Taylor 1006
Fast algorithm for a constrained infinite horizon LQ problem
L. Chisci and G. Zappa 1020

Constrained receding horizon predictive control for systems with disturbances
Y. I. Lee and B. Kouvaritakis 1027
Robust global $\mathcal{L}_2$-gain control of structural non-linear systems
S. K. Nguang 1033

Volume 72 Number 12 15 August 1999

First-order realizations of autoregressive equations
D. Vafiadis and N. Karcanias 1043
Output feedback realization of LQ optimal systems: a general design using data-based synthesis
J.-T. H. Chan 1054
The pole placement problem via PI feedback controllers
J. Leventides, J. Rosenthal and X. A. Wang 1065
Synthesis of upper-triangular non-linear systems with marginally unstable free dynamics using state-dependent saturation
W. Lin and X. Li 1078
Robust sliding mode control with application
Q. P. Ha, D. C. Rye and H. F. Durrant-Whyte 1087
On the estimate of the domain of validity of non-linear H_∞ control
M. J. Yazdanpanah, K. Khorasani and R. V. Patel 1097
Robustness of multivariable discrete-time variable structure control
Y. Eun and D.-I. D. Cho 1106
Asymptotic output tracking with a two level hierarchical system
J. Mari and C. Martin 1116
Adaptive feedforward and feedback control of non-linear time-varying uncertain systems
W. Wu and Y.-S. Chou 1127

Volume 72 Number 13 10 September 1999

Trajectory planning in the infinity norm for linear control systems
M. Egerstedt and C. F. Martin 1139
A timed discrete-event abstraction of continuous-variable systems
J. Lunze 1147
Pole assignment with eigenvalue and stability robustness
J. Lam, W.-Y. Yan and T. Hu 1165
Decentralized routing controller design using overlapping decompositions
B. Ataşlar and A. İftar 1175
Robust pole assignment in descriptor systems via proportional plus partial derivative state feedback
G.-R. Duan and R. J. Patton 1193

Optimization based non-linear observers revisited
M. Alamir 1204
Robust control with adaptation mechanism for improving transient behaviour
M. Maki and K. Hagino 1218
Correspondence
Comments on the examples in 'Dynamic output feedback compensation for linear systems with independent amplitude and rate saturations'
K. Hui 1227
Reply to 'Comments on the examples in "Dynamic output feedback compensation for linear systems with independent amplitude and rate saturations"'
F. Tyan and D. S. Bernstein 1231
Call for papers 1234

Volume 72 Number 14 20 September 1999

A note on the solution of regular PMDs
L. Tan and A. C. Pugh 1235
Controller reduction with closed loop H_∞ performance constraints: a QFT perspective
G. Ferreres and Y. Le Gorrec 1249
Approximate solutions to H_2 optimization problems with H_2 and H_∞ constraints
G. O. Corrêa 1260
Robust constrained control algorithm for general batch processes
M. Alamir and I. Balloul 1271
Robustness of the minimal control synthesis algorithm to non-linear plant with regard to the position control of manipulators
S. P. Hodgson and D. P. Stoten 1288
Frequency domain evaluation of circle criterion, Popov criterion and off-axis circle criterion in the MIMO case
G. Schmitt 1299
Frequency domain design trade-offs for linear periodic feedback systems
G. C. Goodwin and G. I. Gómez 1310
A non-iterative LMI-based algorithm for robust static-output-feedback stabilization
R. E. Benton, Jr. and D. Smith 1322

Volume 72 Number 15 15 October 1999

Stability issues of finite-precision controller structures for sampled-data systems
J. Wu, R. H. Istepanian and S. Chen 1331
Robustness of static sliding mode control for non-linear systems
X.-Y. Lu and S. K. Spurgeon 1343
Robust control and tracking of a delay system with discontinuous non-linearity in the feedback
C. Bonnet, J. R. Partington and M. Sorine 1354
New 2D models and a transition matrix for discrete linear repetitive processes
K. Galkowski, E. Rogers and D. H. Owens 1365
Robust control of a class of sampled-data systems with LTI uncertainties
H. T. Toivonen and M. F. Sågfors 1381
Condensed structural solutions to the disturbance rejection and decoupling problems with stability
J. C. Martínez-García, M. Malabre, J.-M. Dion and C. Commault 1392
Aspects of linear estimation in H_∞
B. Ninness 1402
Limited-complexity model-unfalsifying adaptive tracking-control
S. M. Veres, H. Messaoud and J. P. Norton 1417

Volume 72 Number 16 10 November 1999

The quadratic stability of a discrete-time system with structured uncertainties
Y. Li and X. Xu 1427
Discretized Lyapunov functional for uncertain systems with multiple time-delay
K. Gu 1436
Properties of single input, two output feedback systems
J. Freudenberg and R. Middleton 1446
Finite-dimensional $\mathcal{H}_\infty$ control of linear parabolic systems with unbounded output operators
H. Sano 1466
Feedback design for robust tracking and robust stiffness in flight control actuators using a modified QFT technique
D. F. Thompson, J. S. Pruyn and A. Shukla 1480
Robust control of robot manipulators: a survey
H. G. Sage, M. F. de Mathelin and E. Ostertag 1498

Volume 72 Number 17 20 November 1999

Discrete-time implementation of high-gain observers for numerical differentiation
A. M. Dabroom and H. K. Khalil 1523
Predictive control based on neural network models with I/O feedback linearization
M. Ayala Botto, T. J. J. van den Boom, A. Krijgsman and J. S. da Costa 1538
Optimal directionality compensation in processes with input saturation non-linearities
M. Soroush and S. Valluri 1555
Tracking control of a pendulum using a numerically efficient state estimation approach for polynomic non-linear systems
R. Madhavan 1565
Qualitative validation and generalization in non-linear system identification
G. L. Zheng and S. A. Billings 1592
Exact slow–fast decomposition of a class of non-linear singularly perturbed optimal control problems via invariant manifolds
E. Fridman 1609

Volume 72 Number 18 15 December 1999

Stabilization of linear systems with simultaneous state, actuation, and measurement delays
V. Kapila, W. M. Haddad and A. Grivas 1619
Continuous control-Lyapunov functions for asymptotically controllable time-varying systems
F. Albertini and E. D. Sontag 1630
Linear functional state observer for time-delay systems
H. Trinh 1642
Robust stabilization for generalized state-space systems with uncertainty
S. Xu and C. Yang 1659
Autonomous intelligent vehicle and its performance in automated traffic systems
S. Huang and W. Ren 1665
Adaptive stabilization of uncertain dynamic non-holonomic systems
W. Dong and W. Huo 1689
Subject Index 1701
Author Index 1709